

WHAT IS CLAIMED IS:

1. An Ethernet Digital Subscriber Line Access Multiplexer (DSLAM) for providing dynamic service selection and end-user configuration of service bindings in a digital communication system, said Ethernet DSLAM comprising:

means for receiving login credentials and a service request from an end-user device;

10 means for authenticating the login credentials through an authentication server;

15 means for receiving from the authentication server, a plurality of attributes for configuring the Ethernet DSLAM to provide a service binding corresponding to the requested service, said attributes including an identification of an access network for the requested service, and an identification of a Permanent Virtual Circuit (PVC) on a local DSL loop associated with the end-user device; and

20 means for training a bridging network terminal (NT) having a plurality of PVCs to utilize the identified PVC for sending upstream traffic from the end-user terminal to the Ethernet DSLAM, said training means including means for sending initial downstream traffic from the Ethernet DSLAM to the end-user device utilizing the identified PVC.

25 2. The Ethernet DSLAM of claim 1, wherein the end-user device has a Media Access Control (MAC) address, and the requested service is accessed through a Service Virtual Local Area Network (S-VLAN), and the Ethernet DSLAM includes means for mapping the S-VLAN for the requested service to the MAC address for the end-user device.

3. The Ethernet DSLAM of claim 1, wherein the means for receiving login credentials and a service request from an end-user device includes a User Virtual Local Area

Network (U-VLAN) through which the Ethernet DSLAM communicates with the end-user device, and the requested service is accessed through a Service Virtual Local Area Network (S-VLAN), and the Ethernet DSLAM includes means for 5 mapping the S-VLAN for the requested service to the U-VLAN for the end-user device.

4. The Ethernet DSLAM of claim 1, wherein the means for authenticating includes a RADIUS client that 10 communicates with an external RADIUS authentication server.

5. An Ethernet Digital Subscriber Line Access Multiplexer (DSLAM) for providing dynamic service selection and end-user configuration of service bindings in a digital 15 communication system, said Ethernet DSLAM comprising:

a plurality of subscriber ports for receiving login credentials and service requests from end-user devices, and for communicating data traffic to and from the end-user devices, wherein an identified subscriber port communicates 20 with an identified end-user device;

a traffic mapper that maps data traffic between a plurality of Service Virtual Local Area Networks (S-VLANS) and the subscriber ports;

a RADIUS client that sends login credentials and a 25 service request from the identified end-user device to an external RADIUS server for authentication and receives from the external RADIUS server, a plurality of attributes for configuring the Ethernet DSLAM to provide a service binding corresponding to the requested service, said attributes 30 including an identification of an S-VLAN through which the requested service is accessed, and an identification of a Permanent Virtual Circuit (PVC) on a local DSL loop associated with the end-user device; and

a Service Selection Controller that receives the attributes from the RADIUS client and sends mapping control information to the traffic mapper, thereby enabling the traffic mapper to establish a service binding between the identified end-user device and the S-VLAN through which the requested service is accessed.

6. The Ethernet DSLAM of claim 5, wherein the service binding is established utilizing the IEEE802.1x protocol.

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7. The Ethernet DSLAM of claim 5, wherein the service binding is established utilizing the Point-to-Point Protocol over Ethernet (PPPoE) protocol.

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8. The Ethernet DSLAM of claim 5, further comprising a Dynamic Host Configuration Protocol (DHCP) server that answers DHCP requests sent by the identified end-user device prior to establishment of the service binding, said DHCP server sending a temporary configuration and a short lease time to the identified end-user device.

9. The Ethernet DSLAM of claim 8, wherein the DHCP server ignores DHCP requests sent by the identified end-user device after establishment of the service binding, thereby forcing the end-user device to broadcast a DHCP discover message which is passed on to a second DHCP server in the S-VLAN through which the requested service is accessed.

10. A method of providing dynamic service selection and end-user configuration of service bindings in a digital communication system, said method comprising the steps of:

sending login credentials and a service request from an end-user device to an Ethernet Digital Subscriber Line Access Multiplexer (DSLAM);

sending the login credentials and service request from the Ethernet DSLAM to an authentication server;

sending from the authentication server to the Ethernet DSLAM, a plurality of service binding attributes, said attributes including an identification of an access network for the requested service, and an identification of a Permanent Virtual Circuit (PVC) on a local DSL loop associated with the end-user device;

utilizing the service binding attributes by the Ethernet DSLAM to configure a service binding corresponding to the requested service; and

training a bridging network terminal (NT) having a plurality of PVCs to utilize the identified PVC for sending upstream traffic from the end-user terminal to the Ethernet DSLAM, said training step including sending initial downstream traffic from the Ethernet DSLAM to the end-user device utilizing the identified PVC.

11. The method of claim 10, wherein the end-user device has a Media Access Control (MAC) address, and the requested service is accessed through a Service Virtual Local Area Network (S-VLAN), and the step of utilizing the service binding attributes by the Ethernet DSLAM to configure a service binding includes mapping by the Ethernet DSLAM, the S-VLAN for the requested service to the MAC address for the end-user device.

12. The method of claim 10, wherein the Ethernet DSLAM communicates with the end-user device through a User Virtual Local Area Network (U-VLAN), and the requested service is accessed through a Service Virtual Local Area Network (S-VLAN), and the step of utilizing the service binding attributes by the Ethernet DSLAM to configure a service binding includes mapping by the Ethernet DSLAM, the S-VLAN

for the requested service to the U-VLAN for the end-user device.

13. The method of claim 10, wherein the step of
5 sending the login credentials and service request from the Ethernet DSLAM to an authentication server includes sending the login credentials and service request from a RADIUS client in the Ethernet DSLAM to an external RADIUS authentication server.

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14. A method of providing dynamic service selection and end-user configuration of service bindings in a digital communication system, said method comprising the steps of:

configuring in an Ethernet Digital Subscriber Line Access Multiplexer (DSLAM), a plurality of subscriber ports for communicating with a plurality of end-user devices;

receiving login credentials and a service request from an identified end-user device utilizing an identified subscriber port;

20 sending the login credentials and the service request from a RADIUS client in the Ethernet DSLAM to an external RADIUS server for authentication;

25 receiving from the external RADIUS server, a plurality of attributes for a service binding corresponding to the requested service, said attributes including an identification of a Service Virtual Local Area Network (S-VLAN) through which the requested service is accessed, and an identification of a Permanent Virtual Circuit (PVC) on a local DSL loop associated with the end-user device;

30 configuring the Ethernet DSLAM to provide the service binding corresponding to the requested service; and

mapping data traffic by the Ethernet DSLAM between the S-VLAN through which the requested service is accessed and

the identified subscriber port communicating with the identified end-user device.

15. The method of claim 14, wherein the service
5 binding is established utilizing the IEEE802.1x protocol.

16. The method of claim 14, wherein the service binding is established utilizing the Point-to-Point Protocol over Ethernet (PPPoE) protocol.

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17. The method of claim 14, further comprising the steps of:

receiving by the Ethernet DSLAM, a Dynamic Host Configuration Protocol (DHCP) request from the identified 15 end-user device prior to establishment of the service binding; and

sending an answer to the end-user device from a DHCP server in the Ethernet DSLAM, wherein the answer includes a temporary configuration and a short lease time.

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18. The method of claim 14, further comprising the steps of:

receiving by the Ethernet DSLAM, a Dynamic Host Configuration Protocol (DHCP) request from the identified 25 end-user device;

determining by the Ethernet DSLAM, whether the service binding has been established;

upon determining that the service binding has not been established, sending an answer to the end-user device from a 30 DHCP server in the Ethernet DSLAM, wherein the answer includes a temporary configuration and a short lease time; and

upon determining that the service binding has been established, ignoring the DHCP request, thereby forcing the

end-user device to broadcast a DHCP discover message which is passed on to a second DHCP server in the S-VLAN through which the requested service is accessed.